

**In the Claims:**

Please amend claim 4 to correct an obvious spacing error. Please amend claims 9, 11, 14, 16, 18, 22-23, 27 and 32 to help facilitate express antecedent basis. A complete listing of the claims follows below. No other claim amendments are requested.

1. (Original) In a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, a method of analyzing the input speech signal comprising:

generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value; and

outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector.

2. (Original) A system according to claim 1, wherein the target vector is matched using a perceptual weighting criterion.

3. (Original) A speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:

means for generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value; and

means for outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector.

4. (Currently Amended) A system according to claim 3, wherein the target vector is matched using a perceptual ~~aperceptual~~ weighting criterion.
5. (Original) A speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:
  - an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude pulses, each of said sequences having a different average amplitude value;
  - the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector.
6. (Original) A system according to claim 5, wherein the target vector is matched using a perceptual weighting criterion.
7. (Original) A speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:
  - a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude, variable-sign and variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs;
  - the multi-pulse analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which, according to a maximum likelihood criterion, most closely represents the target vector.

8. (Original) A system according to claim 7, wherein the target vector is matched using a perceptual weighting criterion.

9. (Currently Amended) A system according to claim 7, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.

10. (Original) A speech processing system comprising:

a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;

a target vector generator for generating data including a target vector from at least said input speech signal, and optionally, said short-term characteristics; and

a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable amplitude, variable sign, variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi-pulse analyzer for outputting a signal corresponding to the sequence of equal amplitude, variable sign, variably spaced pulses which, according to a maximum likelihood criterion, most closely represents said target vector.

11. (Currently Amended) A system according to claim 10, wherein the target vector is matched using a perceptual weighting criterion; and

wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.

12. (Original) A speech processing system comprising:  
a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;  
a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics; and  
a multi-pulse analyzer connected to an output line of said target vector generator and an output line of said short term analyzer, wherein said multi-pulse analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi-pulse analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulses which, according to the maximum likelihood criterion, most closely represents said target vector.
13. (Original) A system according to claim 12, wherein the target vector is matched using a perceptual weighting criterion.
14. (Currently Amended) A system according to claim 13, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.
15. (Original) A speech processing system comprising:  
a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;  
a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics; and

a multi-pulse analyzer connected to an output line of said target vector generator and an output line of said short term analyzer, wherein said multi-pulse analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi-pulse analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulses which, according to the maximum likelihood criterion, most closely represents said target vector, and one or more pulse sequence modifiers, each having as input at least a sequence of equal amplitude, variable sign, variably spaced pulses, wherein each said pulse sequence modifier modifies its input sequence and produces as output a sequence of variable amplitude, variable sign, variably spaced pulses.

16. (Currently Amended) A system according to claim 15 wherein the pulse sequence modification function is based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.

17. (Original) A speech processing system comprising:

a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;

a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal;

a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics; and

a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence

analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of equal amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector.

18. (Currently Amended) A system according to claim 17, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.

19. (Original) A system according to claim 18, wherein the target vector is matched using a perceptual weighting criterion.

20. (Original) A speech processing system comprising:

a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;

a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal;

a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics; and

a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said

pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector.

21. (Original) A system according to claim 20, wherein the target vector is matched using a perceptual weighting criterion.
22. (Currently Amended) A system according to claim 20, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.
23. (Currently Amended) A system according to claim 21, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.
24. (Original) A system according to claim 21 wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; and characteristics of the input speech signal.
25. (Original) A speech processing system comprising:
  - a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal;
  - a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal;

a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics; and

a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector, and

one or more pulse-train sequence modifiers, each having as input at least a sequence of equal amplitude, variable sign, variably spaced pulse trains, wherein each said pulse sequence modifier modifies its input sequence and produces as output a sequence of variable amplitude, variable sign, variably spaced pulse trains.

26. (Original) A system according to claim 25, wherein the target vector is matched using a perceptual weighting criterion.

27. (Currently Amended) A system according to claim 25, wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and an ~~the~~ excitation signal from previous frames.

28. (Original) A system according to claim 25, wherein the pulse-train sequence modification function is based on the exponential function.



29. (Original) A system according to claim 25, wherein the pulse-train sequence modification function is based on a linear function.
30. (Original) A system according to claim 25, wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal.
31. (Original) A system according to claim 25, wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal.
32. (Currently Amended) A system according to claim 25, wherein the pulse-train sequence modification function is based on an the excitation signal from previous frames.